

REMARKS/ARGUMENTS

Claim 1 was rejected in paragraph 1 on page 2 of the Office Action for not reciting the word "using". Claim 1 has been amended to add this word. Accordingly, Applicants respectfully request the Examiner to withdraw the §112 rejection of Claim 1.

Claim 1 was also rejected in paragraph 3 on page 2 of the Office Action as being unpatentable over the teachings of Rosencwaig's US Patent 4,636,008 in view of Maris's US Patent 5,706,094. In rejecting Claim 1, the Examiner stated at the bottom of page 2 of the Office Action:

The Rosencwaig reference discloses heating a region of a sample to evaluate surface layers (column 6, lines 57-63) using power modulated at a frequency, note column 6, lines 14 through 17 that discloses "the sample is subjected to periodic localized heating" by a "laser 30 which is modulated by modulator 32".

The Examiner further stated at the top of page 3 of the Office Action:

Claim 1 limits the modulation frequency to "to be sufficiently low to ensure that temperature of said region varies substantially linearly relative to said modulated power", but does not set forth what that frequency may be in terms of Hz. Claim 2, dependent from claim 1, limits the frequency to be "smaller than a maximum frequency beyond which nonlinearities in temperature response of said region become measureable", but again, does not state what the frequency may be in terms of Hz. Claim 3, dependent from claim 2, however does present the maximum frequency in terms of Hz, stating that the maximum frequency to "is approximately 100 kHz." The Rosencwaig reference discloses that the frequency to be used "is preferably greater than 50kHz (column 6, lines 18-19). Thus Rosencwaig teaches using frequencies in the range of 50-100 kHz, which fall within the instant claimed range of less than 100 kHz of claim 3; as claim 3 is dependent from claim 2 and, through claim 2 is dependent from claim 1, Rosencwaig also teaches using frequencies that inherently meet the criteria of those claims.

Note that the above-quoted remarks are the only remarks in the entire Office Action, in which Claim 1 is explicitly discussed. Note also that several limitations of current Claim 1 are not discussed anywhere in the above-quoted remarks.

Claim 1 explicitly states that the first layer comprises at least one crystalline phase from among a plurality of crystalline phases of a compound of a material comprised in said underlying layer. Examples of the material compounds that are covered by this limitation in Claim 1 include, but are not limited to silicon germanium alloy (see page 5 lines 20-21), cobalt or nickel silicide (see page 15 line 5), and titanium silicide (see page 6 line 12).

Claim 1 further explicitly states that the measured signal is used to determine an electrical conductive property of the first layer, wherein the electrical conductive property depends on crystalline phase.

The Examiner has **failed to make a prima-facie case** of obviousness of Claim 1, by failing to address the above-identified (1) "compound of a material" limitation and (2) "electrical conductive property" limitation in Claim 1. Therefore the Examiner is hereby requested to provide specific citations to column number and line number in either of Rosencwaig's US Patent 4,636,008 or Maris's US Patent 5,706,094 where each of these two limitations of Claim 1 are described (explicitly or inherently).

Applicants note that the Examiner did discuss particular materials or classes of materials being measured in a rejection of Claims 15-18 and 21-36, in the middle of page 6 of the Office Action. Although the Examiner has not identified Claim 1 in these remarks, in the interest of furthering the prosecution of this application, Applicants hereby treat the Examiner's remarks as if directed at the above-identified "compound of a material" limitation of Claim 1. In these remarks, the Examiner stated at page 6 of the Office Action:

The references relate the measurements to the type of materials used in semiconductor manufacture. The claimed materials are the type of materials found in semiconductor manufacture, and thus those in the art would reasonably anticipated that the measurements would be useful for these materials as well as the specific materials mentioned by the references, and that any experimentation that would have been necessary to verify the usefulness would have been simple, straightforward, and in no way 'undue'. Patent law does not require absolute certainty, but only a reasonable expectation that does not require undue experimentation. Clearly the reasonable expectation and lack of need of undue experimentation is present for the materials being claimed.

Applicants respectfully traverse the above-quoted remarks of the Examiner, when applied to the above-identified "compound of a material" limitation in Claim 1, as being unsupported in the combined teachings of Rosencwaig's US Patent 4,636,008 and Maris's US Patent 5,706,094. Specifically, ion implanted silicon of the type being evaluated by the methods of Rosencwaig and Maris is silicon on silicon that has crystalline vacancies. In contrast, Claim 1 requires use of the method on one or more compounds, such as an alloy.

As is well known in the art, compounds of the type recited in Claim 1 have different optical properties and different conductive properties, when compared to ion implanted silicon. There appears to be no prior art reason for a skilled artisan to think that a measurement of the type described in the combined teachings of Rosencwaig's US Patent 4,636,008 and Maris's US Patent 5,706,094 which is correlated to **concentration of damage vacancies in silicon** would indicate the claimed **electrical conductive property of a compound** (such as a semi-metallic layer).

Furthermore, for low dose ion implanted regions of the type disclosed by Rosencwaig and Maris, there is little, if any, difference in optical characteristics (such as absorption length) between the implanted region and the substrate. In contrast, Claim 1 compounds, such as silicides, have a very large difference relative to the substrate (e.g. the absorption length of a pump laser drops from 10 microns to a few hundred angstroms). In view of such **different absorption properties of the materials involved**, Applicants believe that a skilled artisan would not be motivated from the disclosures of Rosencwaig and Maris to extend their methods to compounds of the type recited in Claim 1.

If the Examiner disagrees with the just-described distinction between Claim 1 and the cited prior art, Applicants respectfully request the Examiner to provide a prior art citation for the Examiner's position. See MPEP 2144.03 (If Applicant Challenges a Factual Assertion as Not Properly Officially Noticed or not Properly Based Upon Common Knowledge, the Examiner Must Support the Finding With Adequate Evidence).

In addition, Applicants respectfully submit that Claim 1 requires using the measured signal to determine an electrical conductive property which depends on (and is therefore indicative of) crystalline phase. Neither Rosencwaig nor Maris discuss crystalline phases and hence fail to disclose or suggest that an electrical conductive **property which**

depends on crystalline phase should be determined. This limitation in Claim 1 has also not been addressed by the Examiner, thereby failing to make a prima-facie rejection for this additional reason.

For one or more of the reasons discussed above, Applicants respectfully request the Examiner to withdraw the prior art rejection of Claim 1, and also all claims that depend from Claim 1.

Claim 37 is added herewith. Support for a sheet resistance measurement as described in Claim 37 is found throughout the originally-filed application, including, for example, page 15 line 13 and FIG. 3. Applicants respectfully submit that neither Rosencwaig nor Maris state that they can measure sheet resistance. Claim 37 is therefore patentable for at least this additional reason.

If the Examiner should continue to reject Claim 1 over Rosencwaig and Maris in the next Office Action, Applicants respectfully request that the next office action be made non-final because of the above-noted failure to make prima-facie case of obviousness.

For the above reasons, Applicants respectfully request allowance of all pending claims. Should the Examiner have any questions concerning this response, the Examiner is invited to call the undersigned at (408) 982-8200, ext. 3.

**Via Express Mail Label No.
EV 448 866 740 US**

Respectfully submitted,



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